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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,488	10/18/2004	Dan Zhou	UCF-294DIV	3162

23717 7590 09/06/2007

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EXAMINER	
PATEL, TAYAN B	
ART UNIT	**PAPER NUMBER**
1753	

MAIL DATE	DELIVERY MODE
09/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,488	ZHOU ET AL.	
	Examiner	Art Unit	
	Tayan Patel, Esq.	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 Octoiber 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/31/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

IDS

1. The information disclosure statement filed 18 October 2004 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al (US 6838297) in view of Urayama et al (US 6650061).

With regard to claim 8, Iwasaki et al discloses an apparatus for producing nanostructures (nanotubes) (See column 1, lines 12-13) comprising the components of: (a) a temperature controlled electrochemical bath, 60, of electrolyte, 63, a reaction vessel, 64, a substrate/electrode, 11, and a cathode, 62 (See column 7, lines 38-52; See also figure 6); (b) coating catalytic fine particles, 201, inside the nanoholes of the substrate/electrode (See figure 18; See also column 19,lines 15-23); & (c) a power supply, 65, applying an anodization current between the substrate and the cathode (See column 7, lines 38-65). Iwasaki further discloses forming nanotubes (See column 1, lines 11-19), yet fails to explicitly disclose coating the cathode with catalytic nanoparticles.

Urayama et al discloses the formation of carbon nanotubes (See column 27, lines 43-56) wherein the cathode electric layer is formed from a transition metal having a catalytic action in order to provide a low formation temperature in the carbon nanotube (See column 7, lines 25-35)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the catalytically coated cathode in Urayama et al in the apparatus of Iwasaki et al. in order to provide a low formation temperature in the carbon nanotube.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al (US 6838297) in view of Bell (US 4310393).

With regard to claim 9, modified Iwasaki et al discloses all of the claimed limitations as discussed with respect to claim 8 above, further disclosing an electrochemical system with voltage, a catalyst and electrolyte (See column 7, lines 38-65), yet fails to discuss a current density of approximately 12 milliamps per square centimeter between the electrodes.

Bell discloses an electrochemical process containing a catalyst, direct current (voltage supply required) and electrolyte (See column 1, lines 30-38) where current densities within the range of from about 1-1000 milliamps per square centimeter between the anode and cathode in order to provide adequate current between the surface area separating the two electrodes (See column 4, lines 16-25).

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the current density in Bell in the apparatus of modified Iwasaki et al in order to n order to provide adequate current between the surface area separating the two electrodes.

However, the combined references still fail to disclose applying the current density for a sufficient time so that the carbon nanoparticles are developed on said electrodes.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to supply current density for a sufficient time so that the carbon nanoparticles are developed on said electrodes because it would be futile, and therefore

pointless, if the invention stopped supplying a current density prior to the formation of nanotubes on the electrodes.

6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al (US 6838297) in view of Smalley et al (US 2002/0159943).

With regard to claims 10-11, modified Iwasaki et al discloses all of the claimed limitations as discussed with respect to claim 8 above, further disclosing an apparatus for synthesizing nanotubes (See column 1, lines 12-13), yet fails to disclose a nanotube having a diameter of up to approximately 100 nm and a length of up to approximately 50 um.

Smalley et al discloses a method for producing nanotubes (See page 1, para 0010) wherein carbon nanotubes have diameters ranging from about .6 nm up to 3 nm, 5 nm, 10 nm, 30 nm, 60nm or 100 nm and length ranging from 50 nm to 1 millimeter in order to produce yields of single-wall carbon nanotubes greater than 10 wt%, greater than 30 wt% and greater than 50 wt % of the material vaporized (See page 4, para 0064). See also MPEP 2144.05 – Obviousness of Ranges.

It would have been obvious to one of ordinary skill in the art to use the nanotube of specific diameter and length in Smalley et al in the apparatus of Iwasaki et al in order to produce yields of single-wall carbon nanotubes greater than 10 wt%, greater than 30 wt% and greater than 50 wt % of the material vaporized.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tayan Patel, Esq. whose telephone number is (571) 272-9806. The examiner can normally be reached on Monday-Thursday, 8 AM-6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER